FINAL TECHNICAL REPORT / RAPPORT TECHNIQUE FINAL

FINAL REPORT

Osama Mimi ;

;

IDRC Grant / Subvention du CRDI: 108597-001-Empowering Palestinian girls through digital learning innovations in STEM fields

Empowering Palestinian Girls

through

Digital Learning Innovations in STEM Fields

(IDRC 108597)

Final Project Report

by

The Center for Continuing Education, Birzeit University

Submitted to IDRC

October, 2021

ABSTRACT

The Palestinian educational system is in a dire need for transformation[1]. As the world moves into the so-called 4th industrial revolution, and as the future prospects of individuals, societies and nations are becoming more dependent on the quality of their educational systems, the systems in charge of producing this human capital in MENA are grossly under-performing[2]. Traditional approaches to educational reform over the past 3 decades have failed entirely as educational outcomes have continued to fall further behind[3] and the educational establishments continued to be entrenched in their expired educational paradigms. Recognizing this dire need, Birzeit university established an educational research unit called the Unit for Learning Innovation in 2003. This Unit engaged in a design-based research with the aim of identifying and developing outside-the-box solutions and models that can bring about a transformative process that works effectively and affordably within the local MENA context. Several models, and approaches were developed, each building on previous research and knowledge, and in 2014, Birzeit University released a model that proved to achieve significant improvements to learning outcomes while working within the constraints of the existing system. The model was called the Experiential Learning Objects (xLOBs). In 2016, Birzeit University began to implement xLOBs at a relatively large scale in partnership with the Palestinian Ministry of Education. xLOBs for grades 1 and 3 were developed and implemented in a limited number of schools, and plans were being made to implement xLOBs for grades 2 and 4 for the following year. The research results at the time verified the effectiveness of the model as it is being applied in a systematic manner. In 2017, the University agreed with IDRC to begin the development of xLOBs in Science and Math for grades 7 through 10 and place emphasis on the integration of technology in the xLOBs being developed and to examine how gender biases and gaps can be narrowed with xLOBs. The development was carried out during 2017 and implementation began in 2018. In 2019, it was agreed with IDRC to research the scalability of xLOBs regionally, and to pilot the model in a few schools in Jordan. However, just before work began, the Jordanian Minister of Education was changed, and the new Jordanian minister of education decided not start a pilot in Jordan.

In late 2019, there was a ministerial change in Palestine, and the new minister of education, Marwan Awartani decided to stop all previous work being done with xLOBs – even though by then close to 100 thousand children were learning with xLOBs and an entire institutionalization process within the ministry was underway. Awartani refused to discuss, justify, or even accept an external evaluation for the work that had been undergoing on xLOBs through which the ministry was a partner for over 10 years. He even refused to allow a very critical component of the research to go on that would have provided an in-depth assessment of xLOBs, and their impact on teaching and learning. This situation is a typical de-development show-case in MENA where a single politician has the full authority to overnight kill a major development initiative without any remorse or the need to justify his or her actions. This show case highlights the critical importance of transparency and accountability in development. Birzeit University decided to immediately shift the effort and work to

1 *https://thisweekinpalestine.com/our-education-system-is-failing/ . For a more in depth description watch 2012 video that still describes the exact situation with education in MENA today before the political collapse of many countries in MENA: http://www.youtube.com/watch?v=f0gTHJKapSQ. The xLOBs project grew out of Schools.21 mentioned in the video*

2 *According to international exams our children are amongst the lowest performers in the world in problem solving, higher order thinking and innovation and these are the skills which are needed today for our children to survive – let alone excel in today's over populated highly risky world*

3 *For example, in the classical model, educational reform will necessarily require an extremely extensive qualification process for over 60,000 teachers. It will also require a major process of curriculum re-development. The financial and technical implications for this are absolutely beyond the available national*

a partnership that was being forged with UNRWA schools. There was an enormous amount of knowledge, and expertise developed by the project that were ready to be applied immediately as a pilot to 50 UNRWA schools. Just as work began with UNRWA, COVID-19 hit the World. Everything went on hold or on a very reduced pace. IDRC granted the project a 1-year extension, and this allowed the project to continue its pilot with UNRWA schools and to obtain some research results under harsh conditions (including the loss of a parent to COVID for the lead researcher).

Building on the xLOBs model and the sudden and massive need for an effective on-line learning model, CCE, with support from IDRC began the development of iLOBs, an independent, on-line version of xLOBs. Independent in a sense that it has become very clear that educational transformation cannot occur within the mindset and political systems within the Arab World. An independent learning pathway – based on the xLOBs model is necessary to provide children in MENA with any chance for a better education anywhere, any time… and hence a promising future.

This project achieved very important outcomes that include:

1. verifying that xLOBs achieved their learning outcomes for students, and had a significant impact on teacher practices
2. Identifying the tools and mechanisms needed to institutionalize xLOBs within a national educational system/s
3. Establishing a strategic partnership with UNRWA, the 2nd largest educational provider in Palestine
4. Led to the launching of a national campaign to improve the quality of education.
5. Initiated the development of iLOBs – an alternative learning pathway to the single pathway provided by the official educational establishments

Very important lessons were also learnt from this project. These include:

a. When doing development in fragile contexts, it is necessary to have alternative plans, and to be resilient and creative in dealing with unexpected challenges
b. Educational innovation alone is not sufficient to transform education in autocratic dictatorships that do not have a system of accountability
c. It is extremely important to mobilize wide support from the community to scaffold, protect and support any effective educational innovation
d. The xLOBs team should have invested heavily in research communications around the project from the very beginning

KEYWORDS

BZU	Birzeit University
CCE	Center for Continuing Education
iLOBs	Independent Learning Objects
MENA	Middle East and North Africa
MOE	Palestinian Ministry of Education
PISA	Programme for International Student Assessment
UNRWA	United Nations Relief and Works Agency
xLOBs	Experiential Learning Objects

TABLE OF CONTENTS

RESEARCH OBJECTIVES

Research Problem:

The educational establishment is thoroughly entrenched in its own failing educational paradigms. For the past three decades, report after report from various local and international research centers, development agencies, academic institutions, etc. have warned about the devastating consequences of the failure of the educational systems in MENA, unless these systems urgently reform. Yet business continued as usual among governments and educational establishments, even though the worst-case scenarios for most of the predictions of the various studies did occur in terms political, economic and social collapse. MENA governments, educational establishments and leaders consistently failed to embrace any changes or adopt educational solutions that are able to bring about any meaningful change or reform. They continued to adopt the "lessons unlearned" approach: different flavors of the same "reform models" that failed to achieve any difference time on and again. As the vast majority of countries in MENA are dictatorships, with no system of accountability or transparency, and with a poorly educated populous (as a result of the failure of their educational systems), the existing educational paradigms were happy running the way they are.

Birzeit University introduced xLOBs as an educational innovation model designed to address the local context in MENA, a model that is able to significantly raise learning outcomes. The most innovative approach to xLOBs was its ability to work its way around the existing educational model and hence operating within the "comfort zone" of the mainstream educational establishments. Furthermore, because part of the learning resources of xLOBs were on-line resources, xLOBs, the model was framed to be a digital innovation, which helped in it being adopted.

The question was whether xLOBs would be able to make a breakthrough with the status quo? Would the xLOBs as a model as a learning innovation be able to enhance quality and access to education?

General Research Objective:

To better understand the conditions needed to enhance the capacity of the education system in Palestine to improve the accessibility and quality of education through digital learning innovations.

The starting point for this report is to de-construct the elements of the research objectives and elaborate on the extent to which the project achieved these objectives:

- **Digital Learning Innovations:** Birzeit University adopted the experiential learning Objects (xLOBs) to be the model "digital learning innovation" to be implemented in the research. xLOBs are a product of over 10 years of applied research by Birzeit University that was seeking to identify a learning model that would significantly improve learning outcomes for the local context while working within the limitations of the existing educational system (see Annex). xLOBs were selected because several pilots, studies and small research projects have provided clear evidence that xLOBs can make significant improvements to learning outcomes for school children, and improve teaching practices of teachers when piloted with 10-20 schools. This research would identify the conditions and eco-system needed to scale the model at a system's level.
- **Quality of Education:** Education that qualifies children for the challenges and demands of current and future societies and work – covering knowledge, life skills and attitudes.

- **Access to Education:** In Palestine, all children attend school and almost all continue on with the schooling system until grade 9. However, the poor quality of education, and most importantly the lack of availability of alternative learning pathways other than the only failing formal one, means that while there are no significant issues with access to schools, there is a clear issue with access to education...
- **Capacity of the educational system:** Capacity of teachers to provide quality education; capacity of the system to qualify teachers; capacity of the system to provide quality learning resources; capacity of the system to oversee and the implementation of quality education; capacity of the system to research, monitor and evaluate the quality of the education (based on smart quality assessment criteria); and capacity of the system to research the educational results and improve them.

Specific Research Objectives:

1. **To deepen our understanding of the main challenges and opportunities facing the implementation of digitally-driven learning objects in education in Palestine**

   This objective was strongly met. It provided a strong understanding of what it would take to institutionalize learning innovations in Palestine in terms of: i) tools, systems, processes, and educational resources; ii) threats resulting from a lack of a transparent and accountable political system; iii) possible actions and tools to mitigate such threats (massive communications about the successes being achieved with the model and/or a strong advocacy and awareness raising campaign/s); and iv) the importance to have alternative plans and target groups where the research can be redirected (like what had happened by shifting to URNWA schools.

2. **To investigate the impact of digitally-driven learning objects on student aptitude, academic achievements and life skills**

   Such an investigation was carried out throughout the implementation of the project – from the moment the first set of xLOBs were produced on-wards. The final and most in-depth investigation was not be to completed with the MOE because of the new minister decided to pull out of the project, and with UNRWA because of COVID. The project research team had developed sophisticated evaluation tools to verify academic achievement and life-skills (see methodology section). Nonetheless, the observations, interviews and intermediate assessment tools verified that xLOBs had clear positive impact on student aptitude, conceptual knowledge and acquisition of life-skills

3. **To analyze how students' learning, aptitude and achievement vary between traditional and innovative learning environments**

   Such an in-depth analysis did not take place. The research team developed an assessment tool that measures knowledge acquisition, conceptual knowledge and life skills (similar to PISA) on specific units covered by xLOBs. A control and experimental groups were to sit for these exams. This would provide an in-depth analysis on the impact of xLOBs on students' learning, aptitude and achievements. Unfortunately, this critically important research was terminated by the MOE near the end of 2019. UNRWA students had not learned with xLOBs long enough for such an assessment to be carried out.

4. **To investigate whether, and if so how, digitally-driven learning objects affect the educational bias and gender gaps**

   It was not possible to carry out any substantial investigation because of the termination of the project in 2019 because such an investigation necessarily requires an extended period of implementation of xLOBs before significant evidence of change can be collected. Nonetheless, xLOBs themselves were verified to be gender sensitive by the Institute of Women Studies at the University. Furthermore, the teacher training contained gender specific modules. This was particularly necessary because the research team identified clear teacher gender biases, claiming for example that girls preferred "girlie" subjects, while boys preferred "manly" technical stuff. The xLOB designs and the teacher training clearly emphasized shifting teachers away from these cultural and gender biases. Even though it was not possible to investigate the impact of xLOBs on neutralizing such biases, a statement from one of the girls interviewed during the pilot stage was very rewarding. She said "This was the first time I was given a chance to work with machines and technology... and I loved it, and want to engage more in this world...".

5. **To investigate whether, and if so how, digitally-driven learning objects in education affect the performance of teachers and administrators**

   Classroom observations were carried out at the beginning of the project for 10 MOE teachers randomly selected for 8-10 classes each. Observations for the same teachers were supposed to take place following the implementation of xLOBs for two semesters to investigate how xLOBs effected their performance, however this research was obstructed the MOE. Nonetheless, impressions from teachers were obtained during the pilot phase and from the implementation with UNRW teachers through reflection workshops and testimonials. There were clear indications that xLOBs had a clear positive impact on teacher practices in the classroom. A recurring testimonial from many teachers was "xLOBs made us realize that we were not teaching: we were lecturing... we have changed our entire teaching methods and approaches".

Research Implementation:

The project and the research were going on a very positive and well defined course of action from 2017 with smooth partnership with the Ministry of Education at every stage of the project when suddenly there was a ministerial change in Palestine and the new minister of education, Marwan Awartani, decided to terminate the implementation with the Ministry of Education for no reason other than it is MENA and politicians are able to take such actions in the absence of a system of accountability or transparency. This happened in 2019, and was followed by the COVID-19 pandemic/ lockdown in early 2020. Even though some of the specific research objectives could not be completed, the general research objective was partially achieved and very important research results and follow-up actions were obtained.

As a result of the termination of the implementation with the Ministry of Education, the research team shifted the entire research towards a small number of UNRWA schools. However, it was not possible to repeat the research that had already taken place with the Government schools due to project timing and resources, and most importantly because the COVID lockdown had gone into effect. The research continued with the UNRWA, but too many factors changed with COVID: teaching with xLOBs that were not designed for on-line learning, nor were the students, nor the available infrastructure for students, nor teachers, nor was the teacher training, nor were the classroom observations, etc.

METHODOLOGY

The research methodology for this project built on a research journey with xLOBs that had been on-going since the inception of the xLOBs in 2011. A list of the various research studies on xLOBs that have been implemented since the inception of the concept (in Arabic) are available on the following link. The research methodology had to investigate the effectiveness of the developed xLOBs and their ability to meet the set objectives; the readiness and willingness of students and teachers to adopt xLOBs; the effectiveness and efficiency of the tools required to institutionalize xLOBs/ scaling them up; readiness of the educational establishment to adopt and mainstream xLOBs, and ability to scale xLOBs to other providers.

To carry out this research the following methodology was used:

- Baseline study on teachers' and students' attitudes towards teaching and learning was carried out by 15 filed researchers that had semi structured interview with students and teacher in 17 governorates in the West Bank in 2017.
- Classroom observations for 10 randomly selected MOE teachers 8-10 classes each, also to be used as a base line. The same teachers teaching the same students would be observed after they had applied xLOBs for an entire semester.
- Assessment of the implementation of the first draft of xLOB designs as they were implemented in 20 MOE pilot schools – at the level of xLOBs meeting the intended objectives and students and teachers attitudes towards them
- Analysis of the results following the classroom observations after xLOBs had been implemented for at least one semester
- Running the same study on teachers' and students' attitudes towards teaching and learning after learning with xLOBs for one semester.
- On-going reflection workshops, and formative assessments for every stages of the implementation throughout the life time of the project.

Unfortunately the termination of the project by the MOE came at the most critical stage of the research. Classroom observations for 10 randomly selected teachers were carried out for 8-10 classes each in 2018. These observations were classified and thoroughly coded against clear criteria. These teachers then received training on how to teach with xLOBs, and started to teach with xLOBs for a period of time. The next stage of the research was to observe the same teachers teach the same students again as they taught with i) xLOBs, and ii) as they taught the "traditional" way. The observations were investigating any changes in teaching practices, student's attitudes towards learning, and indicators of students' acquisition of life skills. It was at this stage of the research the project was terminated, and even through numerous attempts were made to convince Minister Awartani to at least continue with this component of the research, he refused. Instead, the Ministry ran a rapid superficial evaluation (as described by the ministry itself) and claimed that there were no indicators that xLOBs made any significant changes to teaching and learning. Their evaluation was scientifically and educationally flawed[4], and the Ministry refused to respond to comments on their study or accept an invitation from

[4] The following is a response by the University (in Arabic) to the evaluation report by the Ministry, which the Ministry refused to discuss or respond to.

the University to discuss it. The ministry also refused to appoint an external evaluator to evaluate the program[5].

The research was then re-directed to the UNRWA schools in 2019. However, it was not possible to carry out the research with the same scope. Firstly because the project did not have the time or resources left to carry out the extensive observations that were made for the government schools and the analysis. Only 2 observations were made per teacher twice. Secondly, there wasn't enough time for teachers to apply and delve long enough in xLOBs before the second set of observations was to take place (teaching with xLOBs and teaching without xLOBs), and thirdly the project ran into the COVID-19 lockdown, and too many parameters changed in the entire model and the readiness of teachers, etc. and that compromised the research results significantly.

[5] Ironically, the outcomes of the educational system in math and science in Palestinian Government schools is so poor (average achievement in standardized MOE tests for grade 9 in science and math is in the 20% range), that one has to enquire, what is it that the Ministry was trying to safeguard against by terminating the implementation of this project?

PROJECT ACTIVITIES

The following is a summary of the project activities and time line. A detailed description of the project activities is available in Annex I:

		2018				2019				2020				21	
1	**Research Activities:**	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
1.1	Design and development of research tools															
1.2	Testing and verifying research tools															
1.3	Carry out baseline data collection for Government schools															
1.4	Investigating the implementation of the of the xLOBs on the 25 pilot schools															
1.5	Classroom observations for 10 teachers, 10 classes each by educational specialist															
1.6	~~Classroom observation for teachers after implementing xLOBs~~															
1.7	Carry out baseline data collection for UNRWA schools (reduced version) - pre-observiation															
1.8	Carry out rapid observations for first round of teachers implementing on-line (very limited)															
1.9	Continue observations with UNRWA teachers face-to-face															
1.10	Focus groups with teachers and students															
1.11	Teacher Reflections															
1.12	Data Analysis and Drafting of Research															
2	**Design and Development of xLOBs (on-going review and fine tuning)**															
2.1	Develop the first xLOBs designs that would be used during the pilot stage with 25 schools															
2.2	Collect Feedback from pilot, modify and refine the xLOBs for the large scale deployment															
2.3	~~Research Collect Feedback, modfiy and refine following the deployment at 300 schools~~															
2.4	Design, develop potal and upload xLOBs															
3	**Implementing xLOBs in 25 Pilot Schools**															
3.1	Training of first cohort of Supervisors that are supposed to support the pilot phase															
3.2	Training of Teachers implementing the first revision of the xLOBs on the 25 pilot schools															
3.3	Implementing of xLOBs by pilot group during Semester 1 and 2 of 2019															
3.4	Investigating the quality of xLOBs in terms of content, student interaction															
4	**Implementing xLOBs in 300 Government schools - Institutionalization at MOE**															
4.1	Training of School Supervisors (so they can be ready to support and train teachers)															
4.2	TOT for selected supervisors so they can carry out the training for the 300 teachers															
4.3	Training of 300 Teachers by the supervisors so they can do the scaling up in 100 schools															
4.4	Procurement of tools and materials that the 300 schools															
4.5	Orientation of Government Schools Principals for the pilot schools															
4.6	Orientation of Government Schools Principals for the rest															
4.6	~~Implemenation of xLOBs in 300 Schools~~															
5	**Implementation of xLOBs at UNRWA schools**															
5.1	Face-to-face training for first Cohort of UNRWA Teachers (25)															
5.2	Face-to-face orientation for first Cohort of school principals (20)															
5.3	Initial Implementation before Lockdown															
5.4	Implementation during lockdown (very limited)															
5.5	On-line training for all UNRWA teachers (including first cohort)															
5.6	On-line orientation for the remaining principals															
5.7	Implementation following opening up for Semester 1															
5.8	By some teachers (optional) during Semseter 2															
5.9	On-line Pedagogy Support for UNRWA Teachers															
5.10	~~Field Visits for UNRWA Teachers (wsa not possible becaue of UNRWA restrictions)~~															

PROJECT OUTPUTS

The key outputs of the project can be summarized as follows. A detailed description of each output is available in the table that follows:

- **xLOBs for grades 7 through 10** covering the entire science and math of the Palestinian curriculum developed, piloted, implemented and verified with teachers and students.
- **xLOBs piloted in 20 Ministry of Education schools**, and provided the necessary input for a large-scale deployment of xLOBs in 100 schools.
- **Mechanisms to institutionalization xLOBs** within a large educational system developed and implemented. This included qualifying Ministry supervisors to support and oversee the implementation of xLOBs in the schools, creating a team of teacher trainers at the Ministry (15), providing orientation to principals at 100 schools, establishing coordination team at 17 directorates, training 300 teachers by the Ministry, and establishing research support mechanisms to provide on-going input for the xLOBs research. Similar Mechanisms were deployed in the implementation with UNRWA schools
- **Partnership established with UNRWA**, and xLOBs implemented in 50 UNRWA schools: 100 teachers trained on xLOBs, 50 principals received orientation on xLOBs and approximately 4000 students learned with xLOBs.
- **An extensive research process** implemented, and partially completed. Research tools and intermediate research studies were produced.

The following table provides a list of all the outputs that were listed in the initial project document (proposal), and provides a summary of what was achieved and where challenges were faced.

OUTPUT	DESCRIPTION
1. xLOBs in math and science for grades 7-10 designed, developed, tested and uploaded on the xLOBs portal.	xLOBs for all science and math curricula for grades 7 to 10 were designed and developed. Approximately 2-5 xLOBs were developed per chapter. They were designed based on "educational best practices" that include: • Children are required to produce knowledge on an on-going basis. • Activates designed to create cognitive challenges that trigger higher order thinking • xLOBs included cross and multi-disciplinary topics even though they were covering math and science. • Life skills were integrated within all xLOBs. The Life Skills and Citizenship Education Framework for MENA that was led by UNICEF was used as the foundation for the Life Skills. CCE was a leading partner in developing the framework with UNICEF> • The designs were all based on contexts that engage the students at individual or societal level making them stimulating and inviting. • Using different leaning resources that address different cognitive preferences of different students. • Encourage meta-cognition (student reflecting on their learning) • Include within authentic evaluation techniques
2. 60 math and science supervisors trained as xLOBs teacher trainers.	The initial plan of training 60 supervisors was carried out and completed as planned. However, the project went beyond the training of the supervisors as a process of institutionalization for the xLOBs was adopted by the Ministry (before there was a ministerial change). The institutionalization involved qualifying 17 supervisors from 17 governorates (out of the 60 trained supervisors) to facilitate and coordinate the xLOBs related work among all teachers in all schools per governorate and the research teams

	in the field. as well as the research team in the 17 governorates in the West Bank, and all involved schools
3. 15 MOE Supervisors trained to become xLOBs "Trainers of Teachers"	As part of the institutionalization process with the Ministry of Education team (prior to the ministerial change), a team of xLOBs teacher trainers was created at the Ministry of Education. It is important to note that those master trainers are supervisors and teachers that have been engaged in the various research and piloting stages of xLOBs or joined the development teams and proved to have the pedagogical background and the capacity to train xLOBs. This trainer team carried out the training for the 300 teachers with support from the CCE team. This output was not part of the initial design, but evolved with the project and as the Ministry became more convinced with the xLOBs model and its impact. Creating master trainers within the Ministry was an important component for institutionalization and sustainability of xLOBs.
4. 300 science and math teachers from 100 Government schools trained on xLOBs	The training for the teachers was led by the supervisor's team that underwent the training of teachers – with support and oversight from the CCE team. Teachers were provided training on the pedagogical model behind xLOBs and orientation on how to teach with xLOBs which uses teaching strategies that are very different from the traditional teaching approaches. Following the training, materials that were to be used by schools for the implementation of the practical components of the xLOBs were distributed to schools, and just before the teachers were about to begin implementing xLOBs at schools, the MOE terminated the project.
5. 100 Gov. school principals Oriented	The training of Government School principals took place with three cohorts of principals in three areas: South, Middle and North. The training took place in August 2019. The training provided orientation to the principals how to support teachers and students teach/learn with xLOBs.
6. 70 UNRWA school principals oriented	The principals received orientation on how xLOBs work and what to expect from teachers and students teaching/learning with xLOBs and how to support them.
7. 100 UNRWA teachers trained	UNRWA joined the project at the end of 2019. Observations for UNRWA teachers before receiving training on xLOBs and before teaching with xLOBs was carried out in January 2020 just before the COVID lockdown. The first cohort of teachers received face-to-face training at the beginning of 2020, and just as they started to deliver the training, COVID -19 lockdown went into effect. The rest of the UNRWA Teachers received the remaining of the training on-line. In order to deliver the training on-line, CCE developed a new version of the xLOBs training that is designed to be on-line.
8. At least 10,000 students learned with xLOBs.	It was initially anticipated that at least 10,000 students would learn with xLOBs[6]. However because the ministry pulled out of the project, the final number came to about 3500 students that learned through the UNRWA schools. These numbers would have been significantly higher had it not been for COVID. But teachers were challenged to "regroup" after the lockdown and did not have the mindset to easily engage in an alternative learning model.

[6] *If the 300 teachers would each teach with xLOBs 30 students, then the numbers reached would be reach the target number easily. Teachers were expected to teach many more students though.*

9. A strategy document for scalability of successful innovations	The turn of events in this project did not allow the project to develop the intended strategy document that was expected to be developed with the Ministry of Education. Neither was there enough time during the lifetime of the project to develop a strategy document with UNRWA. However, the University and UNRWA were in the process of developing such a strategy document for scalability of xLOBs with UNRWA schools in Palestine (as a first stage of regional scalability) as this report was being developed.
10. At least 4 policy briefs produced	The turn of events prevented the project from proceeding with policy briefs, however, an initiative called "3a-Wein, Education is the Responsibility of All" was created. The initiative aims at firstly creating awareness around the failure of the educational system within the local community. We believe that the general public is unaware of the magnitude of failure of the educational system and the devastating consequences this is having on the society and on their future. Secondly, the initiative aims at creating a dialogue among educational institutions, youth groups and the public at large around "Good Educational Practices", and finally the initiative aims at creating numerous suggestions to changes, policies, and educational interventions needed to transform the educational system.
11. A package of research results and tools.	All research tools and results are available on the following link:
12. At least two articles published in open access journals	The inability of the project to continue with the most critical part of the research limited the ability to carry out publications. However, two journal articles driven by the turn of events in this project were published: https://thisweekinpalestine.com/our-education-system-is-failing/ https://www.birzeit.edu/ar/blogs/Education-in-Palestine (this article was also published in several local media outlets) During the lifetime of the project there were numerous media encounters, interviews and news releases related to the project. There was also a video documentary on the project: https://youtu.be/Ig-vgfylU9w

PROJECT OUTCOMES AND LESSONS LEARNT

Outcome 1: xLOBs achieved their learning outcomes for students, and had a significant impact on teacher practices (according to student and teacher testimonials, assessment reports and initial research findings)[7].

Outcome 2: The xLOBs Model can be institutionalized and scaled within a National Educational System.
Note: While the final implementation of xLOBs in the schools did not go through, preparations were completed, systems were put in place and were functional, teachers were ready, and teacher trainers were trained. While these were not applied to the MOE, all the learning and knowledge was put to practice with UNRWA, with the added value of having the chance to pilot iLOBs with UNRWA.

Outcome 3: A partnership established with UNRWA, the 2nd largest educational provider in Palestine and the region, providing education to almost half a million refugees in Palestine, Jordan, Syria and Lebanon. UNRWA and Birzeit University are currently investigating the scaling up of xLOBs in all UNRWA schools in the West Bank. Unlike the Ministry of Education, UNRWA is an international NGO with clear systems of accountability and transparency.

Outcome 4: A national advocacy campaign aiming at transforming the educational system was initiated. The notion that even with a program like xLOBs which had every indicator to significantly improve learning outcomes while working with the parameters of the existing system, and without requiring additional resources, etc. could be stopped because a new Minister "feels this way" – highlighted the hopelessness of the situation and triggered the initiation of the national campaign.

Outcome 5: Alternative learning pathways (to the single pathway provided by the official educational establishments) are a must for educational transformation in MENA. In response to the unpredictability of the government run systems and the COVID pandemic, Birzeit University created *i*LOBs, a self-leaning, on-line version of xLOBs (*i* for *i*ndependent, *i*nnovative, and *i*nternet-based).

Lessons Learnt:

Lesson 1: When doing development in fragile contexts, it is necessary to have alternative plans, and to be resilient and creative in dealing with unexpected challenges. Birzeit University had always wanted to work with UNRWA as it is an extremely important service provider for Palestinian children (25% of children in Palestine attend UNRWA schools). However, the University had been developing the xLOBs institutionalization plan with the Ministry for several years. UNRWA (and others) would follow. When MOE decided to terminate the project overnight, the team shifted all their energy to UNRWA schools, and that turned out to be a very rewarding experience, and laid out the ground for a partnership with UNRWA.

[7] The detailed research findings, reports, and tools are available in the link provided in output 11.

Creating an on-line version of xLOBs was also a plan in the pipeline because the value and impact of such an implementation were obvious. When COVID lockdown went into effect, CCE (with support from IDRC), picked up on this idea and created iLOBs.

Lesson 2: Educational innovation alone is not sufficient to transform education in autocratic dictatorships that do not have a system of accountability – even if the innovations are effective, affordable, and scalable and work within the parameters of the existing structures. All it takes is one politician to pull the plug overnight and roll any progress back to the failing state. Considering that the political systems in MENA are unlikely to change soon, it is essential for educational innovators to start developing alternative learning pathways that do not rely on the "mercy" of formal educational structures or the politicians running them. The landscape of technology, connectivity, social media and the like and the change in children and learners behaviour makes his option quite achievable. iLOBs, the Independent Learning Objects were an outcome of this project and the clear fragility of the formal educational structures.

Lesson 3: It is extremely important to mobilize wide support from the community to scaffold, protect and support any effective educational innovation. As an outcome of how this project was terminated (i.e. destroying the only available model that could make a significant difference to education immediately), the project team took a lead in launching an education campaign titled "3a-Wein? Education is the responsibility of All". Interestingly enough as soon as the initiative was launched, the minister of education started to communicate with the project team, and tried to open a communications channel, whereas he had completely refused any dialogue or discussions prior to the launching of the campaign. The objectives of *3a-Wein* are not to lobby for xLOBs. They are to put pressure on the ministry and decision makers to open up and engage the wider community in a transparent and responsible manner in educational reform and give the space for initiatives like xLOBs and others to be implemented – and evaluate them professionally and responsibly.

Lesson 4: The xLOBs team should have invested heavily in research communications around the project from the very beginning. The project was extremely demanding in terms of resources and time. It was easy to overlook the importance of communicating the results locally. Had there been much more awareness about the program and its outcomes, the ministry may have not stopped the implementation.
Note: As a result, CCE is investing heavily today in its communications strategy and the visibility of the work being done. CCE is receiving support from DECI (with support form IDRC) on its communications strategy

OVERALL ASSESSMENT AND RECOMMENDATIONS

This was an extremely important and strategic research project. Pulling the plug by the ministry of education came as a very hard blow to serious hopes for the political willingness in Palestine for educational reform – especially as the project was moving in very scientific and structured

manner, and all indicators were showing clear improvement in the learning outcomes and in teacher practices. The project was show-casing a model that was significantly raising the learning outcomes – while working within the constrained parameters of a rigid educational system. It would have been a showcase that would have been ready to be scaled regionally by the time this report was being written. Furthermore, had the project implementation continued and teachers would have implemented xLOBs during the fall semester of 2019, enough teachers would have worked with xLOBs for at least one semester, and this would have given the team the chance to immediately begin developing an on-line model for teaching/learning with xLOBs when the COVID lockdown occurred (instead of the synchronous educational model adopted by everyone in the region and which was an almost complete failure). This was another major lost opportunity for a potential digital innovation that would have made an important impact in addressing a crisis faced by everyone in the region. Aals, this is the high cost of non-accountable, non-transparent autocratic systems. The decision of one new minister could kill an opportunity for 100s of thousands of children and a promise for a better future – without being accountable to anyone! It is a show-case of de-development that has been going on and will continue to do so in MENA.

As development organizations, we are aware that this situation is part of the eco-system in which we are operating, and we are aware that it is important to be creative and resilient: to continue driving forward, learning lessons, and building on knowledge and experience… And this is what BZU did for this project. We rebounded from the termination by the MOE, and shifted our energy to UNRWA schools. We also sought and received support for creating iLOBs. We also initiated a public advocacy campaign demanding the transformation of education and educational system.

Maintaining the momentum is extremely important. CCE and UNRWA are keen on scaling up xLOBs to all UNRWA schools in Palestine. This will give the project the chance to verify the xLOBs model within a large-scale educational system (and verify the model that was to be done with the MOE). UNRWA is the 2nd largest service provider in the West Bank and Gaza covering 25% of Palestinian school children. UNRWA also operates schools for Palestinian refugees throughout the region: Jordan, Syria and Lebanon. Verifying the model with UNRWA in the West Bank, will open up room to scale it regionally with UNRWA and others.

Finally, Birzeit University wishes to extend sincere thanks for continued support that it has received and continues to receive from IDRC. IDRC has been more of a partner than a funder. The inputs from the various staff members throughout the lifetime of the project and their understanding on how/ where to direct the project through the challenges we faced have been instrumental for the success of this project.

ANNEX I: DETAILED DESCRIPTION OF PROJECT ACTIVITIES

	Activity	Description	Year	Q
1	**Research**			
1.1	Design and development of research tools	This took place at the beginning of the project.	2017	Q4
1.2	Testing and verifying research tools	Testing and verifying of the research tools was carried out with a limited number of teachers	2017	Q4
1.3	Baseline data collection on teachers' and students' attitudes towards teaching/ learning	This was carried out by 15 field researchers carrying out interviews and data collection in 17 governorates with students and teachers. This would create a baseline to be reviewed again following the implementation of the xLOBs at the end of the project.	2018	Q3, Q4
1.4	Classroom observations for 10 teachers, 8-10 classes each by educational specialist	This was developed a qualitative assessment of teacher classroom practices, students' attitudes towards learning and life skills.	2019	Q4
1.5	Investigating the implementation of the of the xLOBs on the 25 pilot schools	Research and assessment for the implementation of the implementation of the 25 pilot schools (see activity 2.2)	2019, 2020	Q1, Q2, Q3, Q4, Q1, Q2
1.6	Classroom observation for teachers and students after teachers had been trained on xLOBs and after they had been implemented the m for two semesters	This was one of the most important research activities that never took place because the minister decided to cancel the project. It would have verify the effectiveness of xLOBs when deployed at a large scale (not only at a pilot number of schools). It would have also provided important insights on the institutionalization process: How effective was the training by the Ministry trainers, how effective were the coordination mechanisms, how well did the students learn (compared to the pilot phase). In addition to answering all of the research questions listed in the specific objectives	2020 2021	Q1, Q2, Q3, Q4 Q1, Q2
1.7	Carry out baseline data collection for UNRWA schools (reduced version)	UNRWA schools joint the project at a late stage, and there was no room for the extensive baseline data collection and classroom observations. Only two classroom observations were carried out per teacher. The research focused mostly on the impact of xLOBs on teacher practices and collected insights on student learning outcomes and skills.	2020	Q1
1.8	Carry out rapid observations for first round of teachers implementing on-line (very limited)	The reduced timescale and the talk about the COVID lockdown pushed the research team to carry out training on xLOBs and immediately begin the implementation and the observations. This significantly compromised the initial research design and the expected results.	2020	Q1

CANCELLED

1.9	Continue observations with UNRWA teachers face-to-face	This occurred after the COVID lock-down began to lift up and after UNRWA teachers had received training on xLOBs (face-to-face). This provided important insights on teaching practices of UNRWA teachers.	2020	Q4
1.10	Focus groups with UNRWA teachers and students	Following the implementation of xLOBs during the first semester of 2021	2020	Q4
1.11	Teacher Reflections	Important insights for the research	2020	Q4
1.12	Data Analysis and Drafting of Research	As indicated earlier, the collected data and the entire research environment was compromised because of COVID health regulations and because limited resources were left in the project (especially after all the equipment was procured for the Gov. schools). The research team developed the research document which were consistent with the findings of pervious work on xLOBs: There is a significant change in teacher teaching practices, students engage significantly more while learning with xLOBs, teachers observe changes in some of the life skills, etc. These results are available in more detail in the annex.	2021	Q1
2	Design and Development of xLOBs (on-going review and fine tuning)			
2.1	Develop the first xLOBs designs that would be used during the pilot stage with 25 schools	xLOBs were developed by creating teams of instructional designers, teachers, supervisors and domain experts. A mapping of the curriculum was carried out and the xLOBs were designed to match the objectives set in the curriculum and text books (plus much more). The design life-cycle involved concept development, testing with small experimental groups, reviews with peers, teachers and then eventually rolled out to pilot schools (25),	2018, 2019	Q1, Q2, Q3, Q4, Q1, Q2
2.2	Collect Feedback from the Pilot, modify and refine the xLOBs so they are ready for the large scale deployment	As the xLOBs were being implemented in the 25 pilot schools the research teams verified the match between the xLOBs and the curriculum, verified that xLOBs being implemented achieved their set goals, identified areas that needed modification or challenges that teacher and/or students faced. All these issues were corrected as the results were coming out, and a revision for a larger scale deployment was developed.	2019, 2020	Q1, Q2, Q3, Q4, Q1, Q2
2.3	Collect Feedback, modify and refine following the large scale deployment of xLOBs in 300 schools		2020, 2021	Q1, Q2, Q3, Q4, Q1, Q2
2.4	Design and finalize portal and load xLOBs on it	This action was finalized at the beginning of 2021.	2020 2021	Q4 Q1
3	Implementing xLOBs in 25 Pilot Schools			
3.1	Training of first cohort of Supervisors that are supposed to support the pilot phase	A first cohort of school supervisors was trained to support the implementation of xLOBs in the pilot schools. Some of the supervisors were involved in the xLOBs design and development process.	2018	Q3

3.2	Training of Teachers implementing the first revision of the xLOBs on the 25 pilot schools	This teacher training was implemented by CCE training teams. The training included 2-3 days of face-to-face sessions, plus coaching, mentoring and support as they implemented xLOBs in the classrooms.	2018	Q3
3.3	Implementing of xLOBs by pilot group during Semester 1 and 2 of 2019	The teachers implemented the xLOBs during the first and 2nd semesters and that gave them and their students enough time to get a feel of xLOBs, and how to work with them, and students' acceptance, etc.	2018 2019	Q3, Q4 Q1, Q2
3.4	Investigating the quality of xLOBs in terms of content, student interaction, and made preliminary observations on Life-Skills acquisition	The fact that teacher and students had enough time and with respect to the research, to provide well thought of feedback and comments on the developed xLOBs and the implementation. It is important to note that the feedback and comments received from xLOBs implementation was consistent with previous studies and research on xLOBs with similar pilot groups.	2018 2019	Q3, Q4 Q1, Q2
4	Implementing xLOBs in 300 Government schools - Institutionalization at MOE			
4.1	Training of School Supervisors (so they can be ready to support and train teachers)	60 supervisors that oversee the 300 selected groups was an important component of the institutionalization being researched. Supervisors need to be aligned with the teaching/learning methods being proposed. Most importantly, they provide support to teachers where need be.	2019	Q3
4.2	Training of Trainers for selected supervisors so they can carry out the training for the 300 teachers	A selected group of supervisors (15) were selected and received extensive training to become teacher trainers. This was the first part of the institutionalization process and an important part of the research. Those trainers were being prepared to conduct the training for the 300 teachers.	2019	Q3
4.3	Training of Teachers by the supervisors so they can do the scaling up in 100 schools/ 300 teachers	The ministry training team (from the supervisors) carried out the training for the 300 teachers, each in their governorate (17 in total). They were provided with pedagogical support and backing up from the University research teams.	2019	Q3
4.4	Procurement of tools and materials that the 300 schools would use in the deployment of the xLOBs	An intensive procurement process took place to provide the 300 schools with the equipment and material needed to implement the xLOBs for grades 7-20 in science and math for these schools.	2019	Q4
4.5	Orientation of Government Schools Principals for the pilot schools	A one-day orientation session for the principals took place		
4.6	Orientation of Government Schools Principals for the rest	3 one-day orientation sessions were organized for schools in the North, Middle and South of the West Bank	2019	Q3
4.7	Implementing the xLOBs in the 300 Schools CANCELLED	The teacher that were trained to implement the xLOBs were ready to start implementing the xLOBs and the research team to begin its observations. The never took place because the new Minister just didn't feel like it.		

5	**Implementation of xLOBs at UNRWA schools**			
5.1	Face-to-face training for first Cohort (25)	This training targeted the first cohort of 25 teachers. It was face-to-face and the rest of the teachers were to follow, but this came to halt for almost one year as a result of the COVID lockdown	2020	Q1
5.2	Face-to-face training for first Cohort of UNRWA principals	One day training for the first cohort of principals	2020	Q1
5.3	Initial Implementation before Lockdown	Teachers began to implement xLOBs at schools just before the COVID lockdown. They ran face-to-face sessions then were forced to stop.	2020	Q1
5.4	Implementation during lockdown (very limited)	Some of the teachers tried to continue working with xLOBs during the lockdown, but faced a range of challenges: • Teachers, students, and the system were not ready for on-line learning, and the adaption of xLOBs by teachers on-line varied widely among teachers and students. It was exceptionally challenging because UNRWA teachers didn't have the time to engage sufficiently with xLOBs and get a deep feeling for how to teach with them • Many students did not have the required on-line access	2020	Q1
5.5	On-line training for all 100 UNRWA Teachers	As a result of COVID lockdown, a new on-line version of the teacher training was designed and developed and all 100 UNRWA teachers attended it after the lockdown was eased off in the summer of 2020. While the xLOBs training was designed to be conducted on-line (not a Zoom version of the face-to-face training), it still had its limitations because xLOBs by design were built for a face-to-face interaction with students.	2020	Q3
5.6	On-line orientation for remaining principals	The principals from the remaining 100 schools received on-line orientation.	2020	Q4
5.7	Implementation following opening up by all teachers for Semester 1	Face-to-face implementations took place after the partial lockdown took place. There were still major challenges because: • Health protocols and distancing limited the ability of children to work in groups, and hence compromised a major component in xLOBs. • The health protocols required classrooms to be spilt into two smaller groups, and this complicated the process and confused teachers especially at this early stage of the deployment. • The research team was not permitted to go to school (again for health protocols) and to provide support or carry out observations	2020	Q4
5.8	Implementation of xLOBs during Semester 2 by 15 teachers/schools	A group of UNRWA teachers decided to continue on with teaching with xLOBs during semester 2. The remainder of the teachers opted to revert to the regular teaching because they wanted to get things back in order after the COVID lock down and wanted to do so within their "comfort zone"	2020 2021	Q4 Q1
5.9	On-line Pedagogy Support for UNRWA Teachers	UNRWA teachers began to implement the xLOBs at schools in the fall of 2020 in a blended format and they were provided with on-	2020 2021	Q4 Q1

		line pedagogical support due to COVID restrictions. That had its limitations for the same reasons above		
5.10	~~Field Visits for UNRWA Teachers~~ CANCELLED	~~Field visits were supposed to be conducted after UNRWA schools had implemented the xLOBs for the purpose of research and support, but this was not permitted due to COVID restrictions.~~		